
^{233}U NEUTRON DATA EVALUATION

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Uranium-233 is the main fissile nuclide in uranium-thorium-fueled nuclear reactors. It turns out that fission data description within a Hauser-Feshbach approach maintains major constraint for the ^{233}U capture, neutron elastic and inelastic scattering, (n,2n), (n,3n) reaction cross sections and secondary neutron spectra evaluation. Absolute fission data at $E_n \sim 3$ MeV and $E_n \sim 15$ MeV are fitted. The rigid rotator optical model potential is obtained based on total cross section and elastic and inelastic angular distribution. Consistency of optical model calculations with recent total data by Guber et al. is investigated [1]. Consistent estimate of capture and fission data is obtained up to $E_n \sim 1$ MeV. Prompt fission neutron spectra (PFNS) were calculated with the model which takes into account contribution of neutrons, emitted in (n,xnf) reaction. Local minima of average PFNS energies at $E_n \sim 7$ MeV and $E_n \sim 12$ MeV are predicted.

^{233}U evaluated data file is compiled. Average unresolved resonance parameters, fast neutron cross sections, angular distributions and secondary neutron spectra differ very much from previous evaluations.

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References

- [1] Guber K. H., Spencer R. R., Leal L. C. et al., Nucl. Sci. Eng. 139, 111 (2001).